

HANDBOOK OF PHONOLOGICAL DATA  
FROM A SAMPLE OF THE WORLD'S LANGUAGES

A Report of the Stanford Phonology Archive

Compiled and edited by

John H. Crothers  
James P. Lorentz  
Donald A. Sherman  
Marilyn M. Vihman

| 270 Hindi-Urdu  | 270 Hindi-Urdu  | 270 Hindi-Urdu  |
|---|---|---|
| 270 01 p  | *[eng]<br>[g-prenasalized] <sup>60</sup>  | 55 m-long   |
| 270 02 p-long   | 30 g-long   | 56 m-breathy voice <sup>01 41</sup><br>[beta-approximant-breathy voice-nasalized] <sup>63</sup><br>(free)                                     |
| 270 03 p-aspirated <sup>01</sup>  | 31 g-breathy voice <sup>01</sup><br>[g-prenasalized-breathy voice] <sup>60</sup>                    | 57 n-dental<br>[n-retroflex] <sup>64 65</sup><br>*/r-flap-retroflex-nasalized/<br>[n-palatal] <sup>65</sup><br>[eng] <sup>65 66</sup><br>*/g/ |
| 270 04 p-aspirated-long <sup>01</sup>   | 32 g-breathy voice-long <sup>01 30</sup>  | 58 n-dental-long  |
| 270 05 b<br>[b-prenasalized] <sup>60</sup>  | 33 q<br>(loan)  | 59 n-dental-breathy voice <sup>01 41</sup>  |
| 270 06 b-long   | 34 q-long<br>(loan)   | 60 l<br>[l-nasalized] <sup>67</sup>   |
| 270 07 b-breathy voice <sup>01</sup><br>[b-prenasalized-breathy voice] <sup>60</sup>  | 35 t/s-hacek <sup>03</sup>  | 61 l-long   |
| 270 08 b-breathy voice-long <sup>01</sup>   | 36 t/s-hacek-long <sup>03</sup>   | 62 l-breathy voice <sup>01 41</sup>   |
| 270 09 t-dental   | 37 t/s-hacek-aspirated <sup>01 03</sup>   | 63 r-trill <sup>07</sup>  |
| 270 10 t-dental-long  | 38 t/s-hacek-aspirated-long <sup>01 03</sup>  | 64 r-trill-long   |
| 270 11 t-dental-aspirated <sup>01</sup>   | 39 d/z-hacek <sup>03</sup><br>[d/z-hacek-prenasalized] <sup>60</sup>                                | 65 r-flap-retroflex-nasalized <sup>43</sup><br>(allo, loan)<br>*/d-retroflex/<br>*[n-retroflex]   |
| 270 12 t-dental-aspirated-long <sup>01</sup>  | 40 d/z-hacek-long <sup>03</sup>   | 66 v-approximant<br>[beta-approximant] <sup>75</sup><br>[w] <sup>68</sup><br>[v-approximant-nasalized] <sup>69</sup>                          |
| 270 13 d-dental<br>[d-dental-prenasalized] <sup>60</sup>  | 41 d/z-hacek-breathy voice <sup>01 03</sup><br>[d/z-hacek-prenasalized-breathy voice] <sup>60</sup> | 67 v-approximant-long   |
| 270 14 d-dental-long  | 42 d/z-hacek-breathy voice-long <sup>01 03</sup>  | 68 glottal stop <sup>44</sup><br>(loan)   |
| 270 15 d-dental-breathy voice <sup>01</sup><br>[d-dental-prenasalized-breathy voice] <sup>60</sup>  | 43 f <sup>32</sup><br>(loan)<br>[phi] <sup>62</sup><br>(free)                                       | 69 h-voice <sup>01</sup><br>[h] <sup>70</sup><br>[h-voice-nasalized] <sup>69</sup>  |
| 270 16 d-dental-breathy voice-long <sup>01</sup>  | 44 f-long <sup>33</sup><br>(loan)   |   |
| 270 17 t-retroflex <sup>02</sup>  | 45 s  |   |
| 270 18 t-retroflex-long <sup>02</sup>   | 46 s-long   |   |
| 270 19 t-retroflex-aspirated <sup>01 02</sup>   | 47 z <sup>33</sup><br>(loan)  |   |
| 270 20 t-retroflex-aspirated-long <sup>01 02</sup>  | 48 z-long <sup>33</sup><br>(loan)   |   |
| 270 21 d-retroflex <sup>02</sup><br>*[r-flap-retroflex-nasalized]<br>[r-flap-retroflex] <sup>61</sup><br>[d-retroflex-prenasalized] <sup>60</sup>             | 49 s-hacek <sup>36</sup><br>(loan)<br>[s-retroflex] <sup>04 37</sup><br>(free)                      | 50 i-long <sup>08</sup><br>[i-breathy voice-long] <sup>71</sup>   |
| 270 22 d-retroflex-long <sup>02</sup>   | 50 s-hacek-long<br>(loan)   | 51 i-long-nasalized <sup>08 09</sup>  |
| 270 23 d-retroflex-breathy voice <sup>01 02</sup><br>[r-flap-retroflex-breathy voice] <sup>61</sup><br>[d-retroflex-prenasalized-breathy voice] <sup>60</sup> | 51 z-hacek <sup>38</sup><br>(loan)  | 52 iota<br>[e] <sup>72</sup><br>[iota-breathy voice] <sup>71</sup>  |
| 270 24 d-retroflex-breathy voice-long <sup>01 02</sup>  | 52 x-uvular <sup>05 33</sup><br>(loan)  | 53 iota-nasalized <sup>09</sup>   |
| 270 25 k  | 53 gamma-uvular <sup>06 33</sup><br>(loan)  | 54 e-long <sup>08</sup><br>[e-breathy voice-long] <sup>71</sup>   |
| 270 26 k-long   | 54 m<br>[beta-approximant-nasalized]  | 55 e-long-nasalized <sup>08 09</sup>  |
| 270 27 k-aspirated <sup>01</sup>  |   | 56 ash/e-glide<br>[ash-long] <sup>73</sup>  |
| 270 28 k-aspirated-long <sup>01</sup>   |   |   |
| 270 29 g  |   |   |

| 270 Hindi-Urdu   | 270 Hindi-Urdu   | 270 Hindi-Urdu   |
|--|--|--|
| (free)<br>[epsilon-dot/e-glide] <sup>73</sup><br>(free)<br>[ash/e-glide-breathy voice] <sup>71</sup>   | 63 u-long <sup>08</sup><br>[u-breathy voice-long] <sup>71</sup><br>64 u-long-nasalized <sup>08 09</sup><br>65 upsilon<br>[o] <sup>72</sup><br>[upsilon-breathy voice] <sup>71</sup><br>66 upsilon-nasalized <sup>09</sup><br>67 o-long <sup>08</sup><br>[o-breathy voice-long] <sup>71</sup><br>68 o-long-nasalized <sup>08 09</sup><br>69 o-open-breathy voice <sup>47</sup><br>(limited) | 70 o-open/o-glide<br>[o-open-long] <sup>73</sup><br>(free)<br>[epsilon-dot/o-glide] <sup>73</sup><br>(free)<br>[o-open/o-glide-breathy voice] <sup>71</sup><br>71 o-open/o-glide-nasalized <sup>09 45</sup><br>(limited)<br>72 alpha-unrounded <sup>48</sup><br>(loan)<br>73 yod<br>[yod-nasalized] <sup>69</sup><br>74 yod-long |
| 270 57 ash/e-glide-nasalized <sup>09 45</sup><br>(limited)   |  |  |
| 270 58 iota-bar <sup>46</sup><br>(loan)  |  |  |
| 270 59 epsilon-dot<br>[ash-breathy voice] <sup>74</sup>  |  |  |
| 270 60 epsilon-dot-nasalized <sup>09</sup>   |  |  |
| 270 61 a-long <sup>08</sup><br>[a-breathy voice-long] <sup>71</sup>  |  |  |
| 270 62 a-long-nasalized <sup>08 09</sup>   |  |  |
| 270 \$a Hindi-Urdu \$A Hindi \$A Urdu \$A Hindustani \$A Khari Boli \$b Standard Hindi-Urdu \$d Indic \$e India; Pakistan \$f 60 million \$g Gary Holland \$g John Crothers (review)   |  |  |
| 270 \$a Kelkar, Ashok Ramchandra \$b 1968 \$c Studies in Hindi-Urdu I: Introduction and Word Phonology \$g Poona: Deccan College, Postgraduate and Research Institute \$q author is native speaker   |  |  |
| 270 \$a Vermeer, Hans J. and Aryendra Sharma \$b 1966 \$c Hindi-Lautlehre \$g Heidelberg: Julius Groos Verlag \$q coauthor is native speaker   |  |  |
| 270 \$a Pinnow, Heinz-Juergen \$b 1953 \$c Ueber die Vokale im Hindi \$d Zeitschrift fuer Phonetik und allgemeine Sprachwissenschaft 7.43-53   |  |  |
| 270 \$a Srivastava, R.N. \$b 1969 \$c review of Kelkar: Studies in Hindi-Urdu I. \$d Language, 45.913-927 \$s Criticizes Kelkar from generative standpoint. No additional data.  |  |  |
| 270 \$a ACCENT \$A In isolation every Hindi-Urdu word has a predictable accent, which phonetically "consists of extra length to the coda non-syllabics or (in case there is no coda) to the nucleus." Position of the main accent is determined by the heaviness of syllables. A "light" syllable ends in a short vowel; a medium syllable ends in a long vowel or short vowel followed by a single consonant; other combinations are heavy. The main accent falls on the heaviest syllable or on the next to last of several equally heavy syllables. A secondary accent falls on heavy syllables preceding the main accent; otherwise secondary accent falls on alternate syllables, reckoning from the main accent. (p.26f)   |  |  |
| 270 \$a BREATHINESS PROSODY \$A In some respects breathiness acts like a prosodic feature. In segmental terms the breathy phonemes are /h-voice/, the aspirated stops and the breathy voice consonants, but this feature expands beyond segmental boundaries. For one thing all vowels are allophonically breathy voice before /h-voice/ in the same syllable, and in rapid speech these fuse into a single breathy voice unit. The sequence /epsilon-dot.h-voice/ may simply become aspiration (breathy voice) on the preceding consonant. In some cases /h-voice/ may shift from post-vocalic to prevocalic position, becoming aspiration of the preceding consonant. Also, sequences of voiced consonant plus /h-voice/ may become breathy voice consonants. Finally, in less formal speech styles there is a type of Grassmann's Law by which the second aspirate in a word, whether it is /h-voice/ or a feature on a consonant, is dropped, leaving a single stretch of breathiness in the word. |  |  |
| 270 \$a NASAL VOWEL PROSODY \$A If the last vowel in a sequence of vocoids (including vowels, glides, and /h-voice/) is nasalized partial nasalization extends through the whole sequence. (p.38)  |  |  |
| 270 \$a RETROFLEXED VOWELS (NON-DISTINCTIVE) \$A "A vowel adjacent to a tautosyllabic retroflex consonant is slightly retroflexed - also, 'iota, upsilon, epsilon-dot' are lower and 'a-long' is more retracted." (p.24f)  |  |  |
| 270 \$a SYLLABLE \$A (C)(G)V(C) \$A Word medially there are a few cases of syllable initial or final consonant clusters, involving "sequences of the type 'nnt, rtt, ttt'" which are not necessarily broken up by a transitional vowel. Otherwise the syllable canon holds true for all native words. (p.64ff)   |  |  |

- 270 01    \$A V & S say that aspiration is weak or lost altogether syllable finally. (p.24) Kelkar mentions this only for voiced aspirates (=breathy voice). (p.24) In any case there is great variability in aspiration. See note on breathiness prosody.
- 270 02    \$A According to Kelkar the retroflex stops are "postalveolar" for Hindi speakers, "cacuminal" for Urdu speakers. (p.23)
- 270 03    \$A The palatoalveolar affricates have no lip rounding. (V & S, p.ix)
- 270 04    \$A [s-retroflex] is "not a true retroflex, but more like [s-hacek] with the apex retracted and raised and with darker quality." (p.31)
- 270 05    \$A /x-uvular/ is "rather retracted and with uvular scrape." (p.32)
- 270 06    \$A /gamma-uvular/ is even more retracted than /x-uvular/. (p.32)
- 270 07    \$A /r-trill/ is "weakly trilled unless geminated." (p.24)
- 270 08    \$A Half-long variants of long vowels occur in the second syllable of disyllabic words, in all syllables of words of more than two syllables, and also prevocally. (V & S, p.9) Kelkar says that the long vowels are progressively longer from high to low, and from front to back. (p.24)
- 270 09    \$A Pinnow (p.46) mentions that nasalized breathy voice vowels occur, but gives only one example.
- 270 30    \$A No example of /g-breathy voice-long/ is found in discussions of geminates by Kelkar (p.64ff) and Vermeer and Sharma (p.36ff, p.48f).
- 270 31    \$A /q/ is characteristic of Urdu. Uneducated Hindi speakers replace it with /k/. (p.31f; Vermeer and Sharma, p.4-5)
- 270 32    \$A /f/ is characteristic of Urdu. Uneducated Hindi speakers replace it with /p-aspirated/. (Vermeer and Sharma, p.4-5)
- 270 33    \$A /f-long/, /z/, /z-long/, /x-uvular/, and /gamma-uvular/ are characteristic for Urdu. Uneducated Hindi speakers replace them with /p-aspirated-long/, /d/z-hacek/, /d/z-hacek-long/, and /k-aspirated/ (for both uvulars), respectively. (Vermeer and Sharma, p.4-5)
- 270 36    \$A /s-hacek/ occurs in both Sanskrit and Persian loans. Replaced by /s/ in familiar speech. (p.31)
- 270 37    \$A [s-retroflex] is restricted to Hindi pronunciation of Sanskrit loans. (p.31)
- 270 38    \$A /z-hacek/ is found only in Persian loanwords in Urdu. Such loans are usually not used in Hindi. (p.32; V & S, p.4-5)
- 270 41    \$A /m-breathy voice/, /n-dental-breathy voice/, /l-breathy voice/ are limited to medial position. (p.28)
- 270 43    \$A /r-flap-retroflex-nasalized/ is found as a separate phoneme only in the pronunciation of loan words from Sanskrit by educated Hindi speakers who know that language. Uneducated Hindi speakers and all Urdu speakers replace it with /n-dental/. (p.36f; V & S, p.5)
- 270 44    \$A /glottal stop/ occurs only in Urdu. Corresponds to "ain," or rarely, "hamzaa," in Persian orthography. "Now very definitely a mark of affectation rather than elegance." (p.32f)
- 270 45    \$A Concerning /ash/e-glide-nasalized, o-open/o-glide-nasalized/ Kelkar (p.55) says the contrasts between nasalized higher-mid and lower-mid (here higher-low) vowels "are not firmly established." He restricts the higher-mid nasalized vowels to Hindi or Urdu social dialects, seeming to indicate that the standard Hindi-Urdu pronunciation has only the lower vowels (i.e. [epsilon] or [ash] nasalized). On the other hand, the nasalized vowels are supposed to be higher than the oral ones (see also p.24), so their quality is hard to determine.
- 270 46    \$A /iota-bar/ only occurs in Sanskrit loans after /r-trill/ or /l/. (p.52)
- 270 47    \$A /o-open-breathy voice/ occurs only as a variant of the sequence [epsilon-dot.h-voice.upsilon], and is either preceded or followed by [h-voice]. (p.49f)
- 270 48    \$A /alpha-unrounded/ occurs in English loans. (p.52)
- 270 60    \$A Voiced and breathy voiced stops and affricates are prenasalized after a nasalized vowel. (p.24)
- 270 61    \$A /d-retroflex, d-retroflex-breathy voice/ are realized as [r-flap-retroflex, r-flap-retroflex-breathy voice] intervocally (except when /r-trill/ follows immediately in the next syllable), word finally, and adjacent to any consonant except /r-trill, v-approximant,

yod/ and the retroflex stops. (p.39f) This rule does not apply in some words of Sanskrit origin, usually when morpheme boundary directly precedes the retroflex. When the preceding vowel is nasalized /d-retroflex/ is realized as [r-flap-retroflex-nasalized]. No examples with the breathy voice counterpart. (p.41)

- 270 62    \$A [phi] is a free variant of /f/ adjacent to tautosyllabic back rounded vowels. (p.32)
- 270 63    \$A /m, m-breathy voice/ are realized as [beta-approximant-nasalized, beta-approximant-breathy voice-nasalized] intervocalically in rapid speech. (p.24)
- 270 64    \$A [n-retroflex] is the formal pronunciation of /r-flap-retroflex-nasalized/. (p.36)
- 270 65    \$A /n-dental/ is retroflex before retroflex stops, palatal before palatal stops, and velar before velar stops. (V & S, p.22)
- 270 66    \$A [eng] occurs as an allophone of /g/ between a nasal vowel and a following nasal consonant. In rapid speech velar stops may be completely nasalized following a nasal consonant. (p.36)
- 270 67    \$A /l/ is nasalized in a syllable with a nasalized vowel. (p.38)
- 270 68    \$A According to Kelkar (p.53) consonantal constriction of /v-approximant/ is optional in the tonic syllable and before /epsilon-dot/, and presumably absent elsewhere. He gives environments for three different glides: [w, upsilon-glide, o-glide]. In view of the highly restricted environments, only [w] has been coded.
- 270 69    \$A /v-approximant, h-voice, yod/ are nasalized adjacent to a nasalized vowel. (p.38)
- 270 70    \$A /h-voice/ has a voiceless on-glide initially. (p.24) (It is not clear whether this means a voiceless [h]. V & S say that "h" is always voiced. (p.xi))
- 270 71    \$A The non-nasalized vowels are breathy voice before /h-voice/. In rapid speech vowel and /h-voice/ fuse into a single breathy voice unit. (p.25) These are interpreted as separate phonemes by Pinnow.
- 270 72    \$A /iota, upsilon/ are realized as [e, o] word finally in Urdu. (p.46f.) Hindi retains the higher vowel. Final short vowels are rare, restricted to a few monosyllables, and to Persian and Sanskrit loans.
- 270 73    \$A /ash/e-glide, o-open/o-glide/ may be realized as [ash-long, o-open-long] in Urdu pronunciation and as [epsilon-dot/e-glide, epsilon-dot/o-glide] in Hindi pronunciation. (p.55)
- 270 74    \$A /epsilon-dot/ is realized as [ash-breathy voice] before /h-voice/ plus consonant or word boundary. (p.50)
- 270 75    \$A /v-approximant/ is realized as [beta-approximant] before /o-long/. (p.53)